

<b>Module title</b>		<b>Abbreviation</b>
Genes, Molecules, Technologies		07-3A3GMOT-152-m01
<b>Module coordinator</b>		<b>Module offered by</b>
Dean of Studies Biologie (Biology)		Faculty of Biology
<b>ECTS</b>	<b>Method of grading</b>	<b>Only after succ. compl. of module(s)</b>
6	numerical grade	--
<b>Duration</b>	<b>Module level</b>	<b>Other prerequisites</b>
1 semester	undergraduate	--
<b>Contents</b>		
<p>The module <i>Gene, Moleküle, Technologien (Genes, Molecules, Technologies)</i> will include lectures on the following topics: The section <i>Spezielle Genetik (Special Genetics)</i> will build on <i>Einführung in die Genetik (Introduction to Genetics)</i> and will deepen the students' knowledge of topics from the following areas: structure and evolution of the eukaryotic genome, regulatory RNA, epigenetically and evolutionarily significant genetic mechanisms. The section will also focus on methods of gene expression profiling, reverse genetics and modern methods of gene function and gene sequence analysis. In the lecture <i>Einführung in die Bioinformatik (Introduction to Bioinformatics)</i>, students will acquire an overview of major areas in the field of bioinformatics: protein sequence and protein domain analysis, phylogeny and evolution of sequences, protein structure, RNA/DNA sequences and structures, cellular networks (regulation, metabolism) and systems biology. During the section <i>Einführung in die Biotechnologie (Introduction to Biotechnology)</i>, students will acquire an overview of the following topics: history of biotechnology, DNA and RNA technologies, recombinant antibodies, molecular diagnostics, nanobiotechnology, biomaterials, bioprocess engineering, microbial biotechnology, transgenic animals and plants, microfluidics. The lecture <i>Einführung in die Pharmakokinetik (Introduction to Pharmacokinetics)</i> will provide students with an overview of the rational development of drugs and active agents. The module component will discuss an important aspect for biologists in more detail: the optimisation of the pharmacokinetics of small molecules and proteins. Pharmacokinetics describes the uptake, distribution, metabolism and elimination of a drug or xenobiotic in an organism.</p>		
<b>Intended learning outcomes</b>		
<p>Students possess an advanced knowledge on genome evolution and the regulation of gene expression and are familiar with current methods in genetics as well as methods for the analysis of DNA and protein databases. They have acquired an overview of both traditional and modern methods in biotechnology and are familiar with fundamental topics in biotechnology. Students have acquired an overview of the fundamental principles of the development and review of active agents in research, clinical practice and the pharmaceutical industry. They are familiar with methods and technologies in biology and are able to evaluate potential applications of these in research and industry.</p>		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (4)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 90 minutes) creditable for bonus		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 61   Nr. 1		
<b>Module appears in</b>		
First state examination for the teaching degree Gymnasium Biology (2015)		

